

## Computers at Home

### Entertainment

ICT has changed the way in which we entertain ourselves at home.



### Games

#### Using a PC

- You can buy a game on disc.
- There are many gaming sites some of which some are free but others you have to pay a subscription.

The speed of the processor is very important. Many PC users buy extra processing power in the form of graphics cards and sound cards to enhance their gaming performance.

## Photography



Digital cameras have revolutionised the way in which we take photographs and we can have hours of fun editing and morphing them. Digital cameras can take movies or still photographs which can then be edited with software packages such as Adobe Photoshop, Windows Media Player or Windows Movie Maker.

As these files are memory intensive they are stored on hard disc or CD writable media.

Common compression formats include jpg for stills or .wmv for film. Printers are photo quality which allows you to adjust the paper feed size and use high quality printing on photo quality paper. You can also buy printer which are dedicated to printing photos e.g. 'HP Photosmart' which can also put special effects such as a sepia and frames on the photos. A computer is not needed with the latter as



the flash memory card is inserted directly into the printer or plug the camera directly into the printer.

Extra **flash memory** cards can be inserted into the camera to increase the number of photos which can be taken, or increase the length of film footage.

## Music

### Download music from the Internet.

There are many sites where you can listen to music both old and the latest releases as a try before you buy.

### Problems

Copyright laws forbid the illegal copying of music including downloading from illegal sites.

### Sound storage devices

Apples new 'Ipod' is small portable external hard disc onto which music can be downloaded from sites such as [www.apple.com/uk/itunes](http://www.apple.com/uk/itunes). Variations on this include the MP3 players from Sony e.g. 'Netman' mini disc player which can record and play music onto minidisk.

### Comparison

- Both are portable
- Both can copy from CD via a computer and download from the Internet
- Ipod has all songs on one hard disc so if faulty songs need to be downloaded again (time consuming)



## Create own music

### Using instruments such as electronic keyboards with Midi interfaces

Digital sound technology allows you to create edit and hear your own music. . PC must be fitted with a quality sound card which fits into a vacant expansion slot in a PC. Sound is in the form of analogue waves which must be digitized in order to be processed

by a computer. In order to hear your digital music masterpiece the digital information must be turned into analogue waves and amplified through speakers. The sound card does the conversion from analogue to digital and vice versa. The sampling rate and the resolution of the sound card determine the quality and accuracy of the sound produced.

The sampling rate is a digital snapshot of the sound waves, the higher the sampling the greater the accuracy Cd sampling rate is about 44,000 samples a second i.e. a 44 kHz frequency.

The resolution of the sound card determines the how accurately the amplitude (sound level) of the sound can be measured. An 8 bit sound board gives 8 bits of data to measure the amplitude i.e.  $2^8$  or 256 sound levels. A 16 bit sound card gives 65536 levels of amplitude. The sound card also has a built keyboards, drums etc. with midi interfaces

Inputs can come from microphones, electronic MIDI (Musical Instrument Digital Interface) is an industry standard format applied to instruments. It is a very compact format e.g. 1 minute of midi synthesized music takes up 30kb of disk space. Compared with 600kb of low quality recorded sound.

Disks are used to store music and they can be loaded and edited such as speeding it up, change pitch, change instruments etc.

### **Software.**

There are three types of music software used to create your own sounds and music.

A sequencer is a multi track recording studio builds up complex files by layering them with simpler ones. 'Magix Music Maker' has over a 1000 sample music files and sounds which can be used by the non musician.

### ***Notators***

This is music composition software.

Musicians write music scores in the traditional way on the computer and the computer plays it. Again it can be edited, change the tempo add lyrics extract individual instrument parts etc.

### **Sound Wave Editors**

A third type of software allows you to edit sound waves. I.e. it allows the digitized sound wave pattern to be edited. It is often used to strip away 'noise'. But it can also be used to change the words people have recorded. Software such as this has led to recorder evidence being discredited in some law cases.

### ***Using Interactive Digital TV***

**Interactive : the user has some inputs into the process**

### **An example of a provider is 'Sky'**

- Received by cable or by satellite
- Need a 'digibox' to receive the signals
- Sometimes have to buy the digibox and pay for installation
- Pay extra monthly cost for the service 'package'

### **Services available;**

- has gaming channels
- Pay to view movies / sports channels
- Shopping
- Betting
- Dating
- Cinema and holiday booking
- Home banking
- Voting

### **Problems**

- Anti social behavior (not mixing with others)
- Addiction
- Extra rental costs for such services
- Extra individual cost e.g. Cost Sky gaming cost approx 75p per minute of telephone charges (*at this time*).
- 'Sky Sports Plus'

### **Mobile phones**

#### **Services available;**

- Text messages
- Voice mail
- Alarm clock/time
- Reminders/ to do list

- Change ring tone
- Record greeting message
- Display photos/ pictures on screen
- Radio
- Some can receive the Internet

### **Advantages of mobile phone**

- Use anywhere there is a signal

### **Disadvantages of using mobile phones**

- No service
- No battery/ run out of credits
- Fined if used when driving
- Run up large phone bills
- Getting mugged

### ***The Internet for Entertainment***

#### **'The Internet a network of networks'**

The Internet is a **Wide Area Network** - actually it is a huge **collection of networks connected** together by what are called **gateways** - these make the system act as if it was one huge network.

**ISP (Internet Service Provider)** ...e.g. Freeserve, AOL, Demon and hundreds of others.

### Hardware and software needed to access the Internet

- Computer system
- Modem or ISDN card or broadband link
- Communication software provided by the ISP

Modem is needed for analogue to digital conversion  
ISDN line is faster than a normal tel. line  
Broadband is faster than both

***NB telephone line is NOT hardware***

Structure of a URL

<http://www.demon.com/welcome/index.html>

**HyperText Transfer Protocol**

**The domain name – can indicate owner, type of site and country**

**Folder on server**

**Web page to be presented to the user**

### Services available on the Internet

- **Search engines** which allow you to search the World Wide Web for any topic, and each page has **links** to another and so on....
- **Download** software and files (e.g. weather pictures)
- **Bulletin boards** (forums) or **newsgroups** are also set up where you can leave messages, or communicate directly with other users.
- **Chat lines** Allow online realtime 'chat' facilities with anyone who is on the Internet at that time.
- **Email**
- **Online booking**
- **Ecommerce- online shopping**
- **Online banking**
- **Online voting and betting**

### Dangers of Chat lines

You don't know who you are really talking to. Many pedophiles try to contact young children on chat lines. '**Grooming**' is a term applied to this process and it may take many months for the pedophile to build up confidence in the teenager before arranging to meet them.

## Code of conduct for using Chat lines

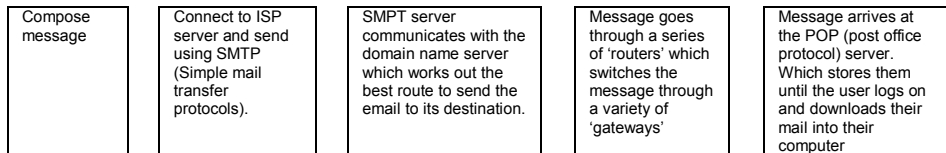
- Never arrange to meet anyone on a chat line
- Never give them your personal details such as your name, email, home address, Tel. No. name of school or names of any of your friends.
- Don't go into private rooms with people you don't know.

## Electronic mail

### Definition:

Mail sent between two computers

### How email works



### Structure of an email address



organisation

Co    Company  
Org    Organisation  
Gov    Government agency  
Com    Communications provider  
Net    Network provider

Uk    United Kingdom  
De    Germany  
Es    Spain

## Advantages of electronic mail

- Faster to deliver the mail
- Messages can be sent across the world for the price of a local phone call
- Add attachments
- People don't have to be in.
- One letter can be sent to several users' mailboxes at the same time.
- Better security – will not get lost

## Disadvantages

- Reliant on having suitable hardware and software
- Problems of hacking
- Potential for spreading a virus

- Firewalls will often restrict an email size e.g. to 1 or 2 MG meaning some longer or multimedia files cannot be received.

## ***Online Booking Systems***

### **Book cinema or theatre tickets, holidays etc.**

Theatre and, concert tickets, holidays, flights etc, can be booked using both interactive television and the Internet. The home user can now access remote online databases for their computer enquiry and booking system.

People can search for holidays etc. to suit their requirements and make provisional or firm bookings

### **Advantages to the online booker**

- Services are available 24 hours a day
- Bookings can be made at home
- Alternatives can be proposed if first choice not available
- Access to data on a wide range of holidays including special offers.
- Bookings are instantaneous so little possibility of overbooking because once a seat or holiday is provisionally booked this will appear on the database

## ***Teleshopping / E-Commerce***

This means selling goods and services over the Internet or through your interactive TV.

On the Internet businesses set up **websites** on the Internet because...

- they can advertise to more people.
- people can email them with enquiries; orders; requests;
- they don't have to publish printed catalogues

Through the Interactive TV

There are special shopping channels

### **Advantages**

- Can buy 24 hours a day, 365 days a year
- No need to handle cash since all transactions are made using cards
- Less staff needed

## ***Online banking***

### **Online or Homebanking**

Customers can access their bank account details from home across the Internet

### **Advantages**

- Customers don't have to leave home to pay bills etc
- Savings on postal or travel costs
- Pay bills anytime

### **Problems which could occur when customers use ATMs or obtain cash from the high street bank**

- Could be attacked/security
- Could forget PIN
- Wrong amount of money issued
- Card could be retained
- Card might get damaged

### **Problems**

- Hacking of credit card / debit card details - people who might misuse the data.
- Have to pay telephone charges whilst online.

Unauthorised access prevent by **PASSWORDS** or **PIN No**

### **EFTPOS**

Banks can move money between one bank account and another electronically over computer networks. This is called **Electronic Funds Transfer** or **EFT** for short.

BACS is one example of the application of **EFT**.

Most of us encounter EFT in our daily lives without thinking about it. When a customer pays for goods in a shop or supermarket using a debit card, the customer and retailer accounts are updated electronically. If they pay at an electronic terminal, called an **Electronic Point Of Sale** terminal (**EPOS**), then this is called **EFTPOS**, or **Electronic Funds Transfer at Point Of Sale**.

Although the processing could be completed in real-time, the transactions in the UK are usually uploaded and processed as a batch overnight and then the customer and retailer accounts are updated.

This time delay can also be noticed in your bank balance when bills are paid electronically. The processing again happens in batch mode overnight.

### **Advantages**

- Can buy 24 hours a day, 365 days a year
- No need to handle cash since all transactions are made using cards
- the transactions are automatic, saving staff costs
- the process is almost paperless
- the customer can print off an on screen receipt
- the delivery process can often be tracked online
- goods are often discounted because of lower retail costs

Conversely, items that are not selling well can be easily identified by querying the database

- An authorisation and authorisation code are generated if there is enough money in the shopper's account to pay for the goods. A record is created to settle up between the shopper and retailer's banks 2 or 3 days later. Alternatively, the authorisation may be rejected because of insufficient funds in the account. The central switch system sends a message with the result to the till at the checkout.



- If authorisation is granted a debit payment slip with an authorisation code is printed for the customer to sign.
- The transaction is then completed and a card voucher (shown below) with details of the transaction is given to the customer as a record to keep. The transaction will also appear on the shopper's monthly bank statement.

### Summary

- EFTPOS provides the means for retailers to process sales and payments automatically.
- The connectivity between the stock database and sales also allows for automatic stock control.

### Credit Cards - Borrow money so cash does not have to be in account at time of purchase

Credit cards can be used instead of cash or cheques for payment. Each card has a **unique number**, a date it is valid from, an expiry date, a name and a **hologram**. The hologram is the small shiny picture to the right of a card. It is there for security reasons to deter potential forgers. A dove is the hologram on VISA cards, a map of the world is on MasterCard's. On the back of the credit card is a **magnetic stripe**. This stripe stores a small amount of information about the account holder; their account number, bank sort code, encoded PIN, and withdrawal limit.

People using credit cards do not need to pay for their goods or services until the end of the month. The retailer gets paid by the credit card bank immediately. A credit card guarantees a retailer payment but also charges the retailer a percentage, about 2%-5%

for processing.

The owner of a credit card receives monthly statements listing all purchases made with the card. Each one is shown with a date, amount and who the payment was made to. The purchases are totalled and a balance shown.

The balance may be paid in full at the end of the month or just an instalment. Interest accrues on the outstanding balance and must be paid each month with another instalment.

Credit card companies set a **credit limit** for each account holder. When a purchase is made, the retailer's electronic till connects to the credit card company to get the payment authorised. Sometimes this only needs to happen if sales are over a certain amount called a **floor limit**. A check is made to see whether the new total would be within the credit limit. If the sale is approved then the transaction is authorised and the amount is added to the credit card holders balance. An equivalent amount is credited electronically to the retailer's account.

Sales are refused if the credit limit is exceeded.

There is also a extra No added to the back of the card to check card details are correct.

### Debit cards - cash does not have to be in account at time of purchase

A debit card is similar in appearance to a credit card but there is usually another logo, SWITCH (in green) or DELTA that identifies it as a debit card. Like credit cards, each card has a unique number,

a date it is valid from, an expiry date, a holder's name, a hologram and a magnetic stripe on the back containing basic account information. In the card shown, the card also doubles as a cheque guarantee card and the maximum guaranteed is shown as part of the hologram. These cards also carry an additional number called an Issue Number.

### **Is there enough money in the account?**

When a payment is made by debit card, the shop's computer connects with the card holder's bank to check that the card holder's bank balance can cover the amount of the sale.

If the sale is authorised by the computer, a sales slip is printed which the card holder signs. The signatures on the card and sales slip are compared to make sure that the card is not being used fraudulently.

The transaction amount is transferred electronically from the card holder's bank account to the retailer's bank account a few days later. The delay is there for traditional reasons in that cheques always take a few days to clear. The accounts could be credited and debited instantly. Transactions made using a debit card appear on ordinary bank statements.

**An important difference between debit and credit cards - the card holder must pay almost immediately and does not have any credit facilities with the card.**

<b>Card crimes</b>	<b>Prevention</b>
Stealing cards at ATMs	Do not write down PIN numbers Do not let anyone see you typing in your Pin number
Stealing debit and credit cards	Photos on cards Lower the amount that can be spent using cards before seeking authorisation Details of stolen cards put on POS terminals
Credit card fraud on the Internet and their misuse	Use agreed words on some sites Use a secure service
Card copying	Programmable smart cards to make data difficult to copy Use of holograms to make cards difficult to copy.

## **Communications and Information systems**

### ***Teletext***

Teletext systems provide an information service using adapted television sets. The information is broadcast along with the normal **television signal**. The BBC teletext service is called CEEFAX.

The information is divided into numbered pages, each of which fills a TV screen eg the latest news, the weather forecast, travel news, share prices, TV schedules, etc...

A teletext service generates about 200 pages of information.

The system is **non-interactive**. ie the user may call up a page of information using a hand-held key-pad, but may not send information back.

The **system is free** once it has been installed.

### ***Internet, Intranet and Extranet***

The Internet is a **Wide Area Network** - actually it is a huge **collection of networks connected** together by what are called **gateways** - these make the system act as if it was one huge network.

Many networks in industry, business, higher education and government institutions are all connected to the Internet although anybody can now get connected to the system with the appropriate hardware and software and access to an **ISP (Internet Service Provider)** ...eg Freeserve, AOL, Demon and hundreds of others.

A user can get information on just about everything. There are **search tools** which allow you to search the World Wide Web for any topic, and each page has **links** to another and so on....

- it is also possible to **download** software and files (eg NASA graphics)
- **bulletin boards** (forums) or **newsgroups** are also set up where you can leave messages, or communicate directly with other users.

Businesses set up **websites** on the Internet because...

- they can advertise. It enables people to find out what they do and what they sell.

- people can email them with enquiries; orders; requests;
- they can reach an international audience.

### **Intranets**

An **intranet** is set up entirely within a LAN. Web pages can be stored and accessed from anywhere on the network and email can be sent internally within the LAN.

A company can set up an intranet and allow its workers to send messages to each other and use a browser to access company information saved as web pages. It can also be used for staff training.

### **Extranets**

If a company allows some access from outside to its intranet, then it becomes an **extranet**. Access would normally be through a **firewall** (software which only allows permitted users to access the data).